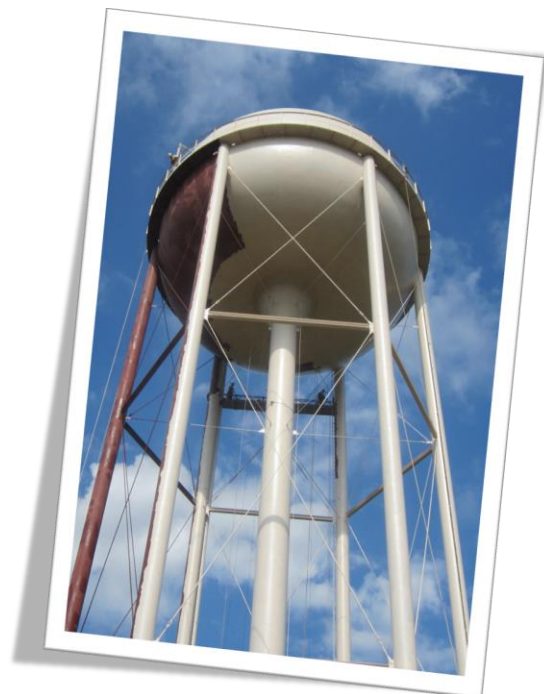


# **Report to the Governor**

## **Commonwealth of Kentucky's Capacity Development Program for Public Drinking Water Systems**

**September 2014**



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## Executive Summary

The United States Environmental Protection Agency (US EPA) oversees the nation's public drinking water supply through the Safe Drinking Water Act (SDWA). The Act was amended in 1996 to provide additional requirements for source water protection, operator training, specific contaminants, and public information. The amendments also established the Drinking Water State Revolving Fund (DWSRF) and guidelines for small water systems to develop their technical, managerial, and financial capabilities.

The Division of Water's Capacity Development program was created in 2006 to evaluate small PWSs technical, managerial, and financial capabilities and to assist these PWSs in improving their technical, managerial, and financial capacity. The division improved on current practices in 2006 with the implementation of the Capacity Development program and the sanitary survey process. The Capacity Development program put every public water system (PWS) in the state on a triennial sanitary survey schedule by 2010. The sanitary survey process provides an evaluation of the systems' technical, managerial, and financial capabilities based on criteria developed by Division of Water personnel in conjunction with the Division of Water's informal Drinking Water Advisory Committee which consists of industry and stakeholder representatives. The division's Capacity Development and Technical Assistance personnel provide support and guidance as needed where indicated by this evaluation. As the program has progressed, annual and triennial reports have documented significant improvement in the technical, managerial, and financial capabilities of PWSs.

The sanitary survey provides the basis for the evaluation of public water systems' technical, managerial and financial capacity. The information gathered in the initial surveys provides a baseline against which to measure capacity in subsequent assessments. The triennial surveys are both informative and productive, as the on-site time has allowed division personnel to become more familiar with the PWSs in order to provide more specific direction and guidance as needed. The time spent with PWS personnel has provided a venue for discussions, as well as a hands-on learning

### The Strategy

The Capacity Development Strategy provides a guideline for the implementation and maintenance of the Capacity Development Program; it addresses the five elements established by Section 1420(c) of the SDWA.

- ◆ The methods or criteria the EEC will use to identify and prioritize the PWSs most in need of improving technical, managerial, and financial capacity;
- ◆ A description of the institutional, regulatory, financial, tax or legal factors at the federal, state or local level that encourage or impair capacity development;
- ◆ A description of how the EEC will use the authorities and resources of the SDWA as amended by PL 104-182, or other means, to assist PWSs in complying with national drinking water regulations; encourage the development of partnerships between PWSs to enhance the system capacity of PWSs; and assist PWSs in the training and certification of operators;
- ◆ A description of how the EEC will establish a baseline against which to measure improvements in system capacity with respect to national primary drinking water regulations, this chapter, KRS 224:10-110, and administrative regulations promulgated there under; and
- ◆ An identification of the persons having an interest in and are involved in the development and implementation of the system capacity development strategy, including all appropriate agencies of federal, state and local governments, private and nonprofit PWSs, and PWS customers.

environment for providing technical, managerial, and financial assistance.

The Capacity Development program has proven successful in its mission to improve the technical, managerial, and financial capabilities of small PWSs through the sanitary survey process and various methods of assistance (i.e. guidance documents and other tools, and direct on-site assistance). Tracking of Notices of Violation (NOVs) for sanitary survey noncompliance began in 2011. Not surprisingly, the trend of NOVs issued over this period decreased from 22 in 2011 to zero on 2014, which highlights the positive impact of the Capacity Development program. In addition, the division has taken no enforcement actions related to sanitary surveys since SFY2011. These trends indicate a better understanding of the Capacity Development program requirements and of the Safe Drinking Water Act in general as PWS operators and managers become better educated and more aware of pertinent issues.

The effectiveness of the Capacity Development program can also be assessed by comparing the results of the initial baseline survey to subsequent surveys. This comparison is based on whether a PWS possesses or lacks one, two, or all three of the capacity parameters (technical, managerial, or financial). Comparisons for the first two rounds of sanitary surveys reveal significant improvements in managerial and financial capacity; primary concerns of the Capacity Development Program.

Maintaining the technical, managerial, and financial viability of a drinking water system is a significant challenge for small PWSs. The Capacity Development program, in conjunction with its partners and stakeholders, works to identify ways of helping PWSs to address technical, managerial, and financial issues through innovative and improved methods of operation and management.

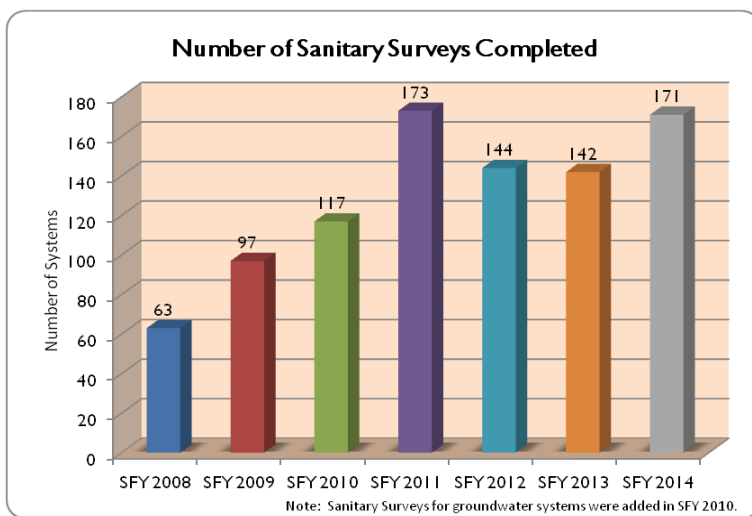
As originally designed, the Capacity Development program is focused on providing assistance to the small PWSs throughout the state. Over seventy percent of the 456 PWSs in the state serve communities with less than 10,000 people; over forty percent serve communities with less than 3,300. Capacity Development personnel continue to work on guidance documents and other tools for PWSs' use to improve performance, achieve compliance, and increase technical, managerial, and financial capacity. In addition, program personnel are continually looking for ways to improve communications, streamline the sanitary survey process, reduce staff administrative time, better identify inadequately performing systems, and provide incentives for outstanding performance. By reducing time spent on the sanitary survey process, staff will be able to devote more time to assist small PWSs.

## The Capacity Development Program

The Safe Drinking Water Act (SDWA) is the primary federal law created to ensure the protection of public health by “regulating the nation’s public drinking water supply” (US EPA). The SDWA was amended in 1996 to provide additional requirements for source water protection, operator training, specific contaminants, and public information. These amendments also established the DWSRF and guidelines for small water systems to develop their technical, managerial, and financial capabilities. In order for states to receive the full allocation of DWSRF funds, the SDWA requires states to develop and implement a Capacity Development program.

The Division of Water implemented the Capacity Development program and the sanitary survey process in 2006. With this, every PWS in the state providing drinking water from surface water sources was scheduled for a triennial survey. Three years later, PWSs with groundwater sources were also included.

The sanitary survey process provides an evaluation of the systems’ technical, managerial, and financial capabilities based on various criteria. The survey identifies deficiencies and makes recommendations which are presented to the utility for action. Capacity Development and Technical Assistance personnel provide support and guidance to address identified deficiencies as needed. PWS have now been through at least two cycles of the sanitary survey process. Annual and triennial reports have documented significant improvement in the technical, managerial, and financial capabilities of PWSs.



## **Kentucky's Strategy**

Essential to the Capacity Development program is the strategy conceived at inception. The Capacity Development strategy was initially developed in collaboration with industry stakeholders; and subsequently approved by the US EPA. The strategy is dynamic in nature necessitating revision periodically as technologies and trends change and improve. In 2008 – 2009, the inaugural strategy was reviewed and amended. The revisions again went through a stakeholder review, prior to submission to and acceptance by US EPA. In the past year, the Division of Water has again begun the review and revision process.

The Capacity Development Strategy provides a guideline for the implementation and maintenance of the Capacity Development Program. The Strategy addresses the five elements established by Section 1420(c) of the SDWA, as shown on Page 1.

The first goal was to develop a means of identifying and prioritizing PWSs most in need regarding technical, managerial and financial capabilities. These priority PWSs were identified through the sanitary survey questionnaire and process.

During this identification and prioritization process, the second goal to identify factors encouraging or impairing the capacity of water systems was implemented and these factors considered.

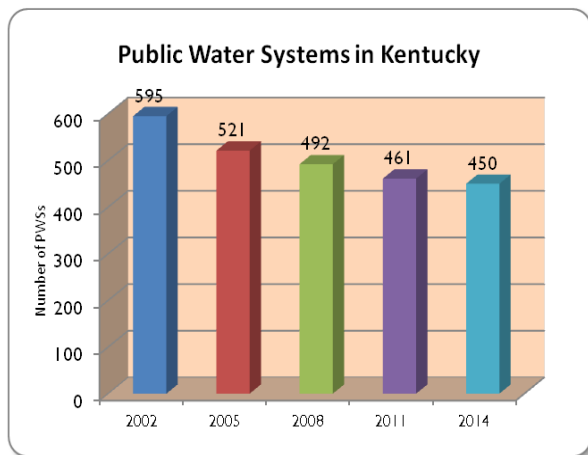
The third strategic element addresses how the state will and encourage and assist PWSs in improving their capabilities using the various authorities of the division and available resources. Technical assistance, training, and funding are all methods employed by the division in addressing this element.

The fourth strategic element establishes a baseline for evaluation of the PWS technical, financial and managerial capabilities. This was accomplished through the first round of sanitary surveys. This information provides a starting point for evaluating system capacity and evaluating the effectiveness of the DWSRF program as a whole.

The implementation, operation, and evaluation of the Capacity Development program, as a whole, should be of prime importance to all citizens of the Commonwealth as it can have direct and indirect impact on their lives, businesses, and ways of life. The principle of transparency is emphasized throughout the Capacity Development program as all applicable stakeholders, as recognized within the strategy document, are encouraged to participate in program development.

## Implementing the Strategy

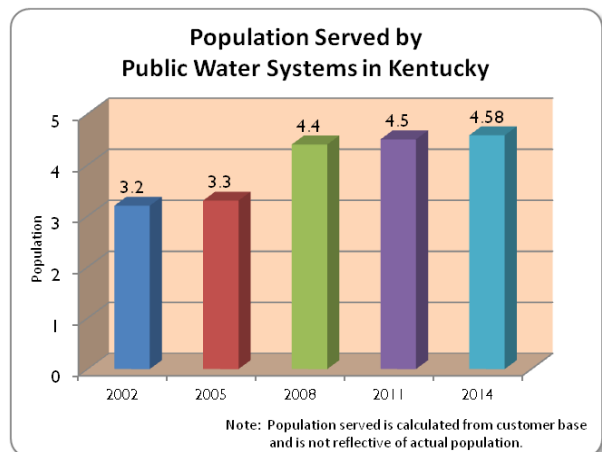
The sanitary survey provides the basis for the evaluation of public water systems' technical, managerial and financial capacity. The information gathered relative to plant operations, operator certification, financial standing, and managerial aptitude in the initial surveys provided a baseline against which to measure capacity in subsequent assessments. PWSs are visited every three years and evaluated against the baseline data, any subsequent surveys, and other available information. Over the past several months, the division has worked to streamline the sanitary survey process to improve productivity and efficiency as well as to ensure that the evaluation is an objective and empirically based process.



Kentucky PWSs resulting in many fewer PWSs. Over this period, the number of Kentucky's PWSs decreased from more than 600 PWSs to a present number of 456 PWSs.

The initiative was designed to provide potable water to all citizen's of Kentucky by the year 2020. The initiative has been successful to date as that goal is very near. Approximately 95% of Kentuckians now have access to PWS water.

Since the 1999 Water 2020 initiative created by then-Governor Patton, the Division of Water has worked with communities, the Kentucky Infrastructure Authority, the General Assembly and others to ensure that potable water was available to everyone in the state. On outcome of this initiative is large-scale regionalization of



The need for ensuring public water systems are properly operated and maintained was recognized in the conception of the Capacity Development program. The Capacity Development strategy identifies objectives to be addressed by the Capacity Development program:

- ◆ **Prioritize systems most in need of improving capacity.** The results of the sanitary survey provide direction for determining those in need of assistance. The DWSRF program also addresses prioritization as systems applying for DWSRF funding are evaluated and ranked according to need.

- ◆ **Identify factors encouraging or impairing the capacity of water systems.** During the development of the sanitary survey questionnaire and process, various factors influencing capacity development were considered.
- ◆ **Use the authority and resources of the SDWA to enhance technical, managerial and financial capacity.** Technical, managerial, and financial assistance is provided to PWSs through guidance documents, templates, and training. Improved operation is encouraged through the operator certification program. The DWSRF provides funding for the improvement of failing infrastructure.
- ◆ **Establish a baseline and measure the capacity improvements of systems within the state.** The sanitary survey establishes a baseline and evaluation process for determining PWS's technical, managerial, and financial capacity.
- ◆ **Involve stakeholders in state efforts to improve water system capacity.** The importance of transparency is emphasized throughout the Capacity Development program with the inclusion of the Drinking Water Advisory Committee stakeholders group.

The sanitary survey process provides the means for evaluating public water systems for their technical, managerial, and financial capabilities. The technical evaluation is based on regulatory requirements and may result in notices of violation or other enforcement action. However, evaluations for managerial and financial capacity are generally based on best management practice and result in recommendations based on compliance with these principles.

Capacity Development personnel have found the triennial surveys to be both informative and productive, as the on-site time has allowed personnel to become more familiar with the systems in order to provide more specific direction and guidance as needed. The time spent with PWS personnel has provided a venue for discussions, as well as a hands-on learning environment for providing technical, managerial, and financial assistance.

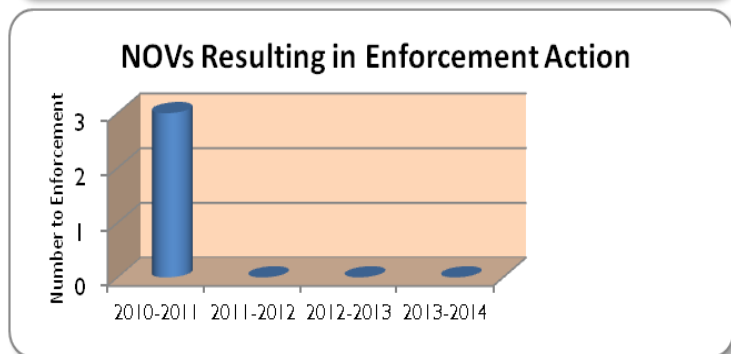
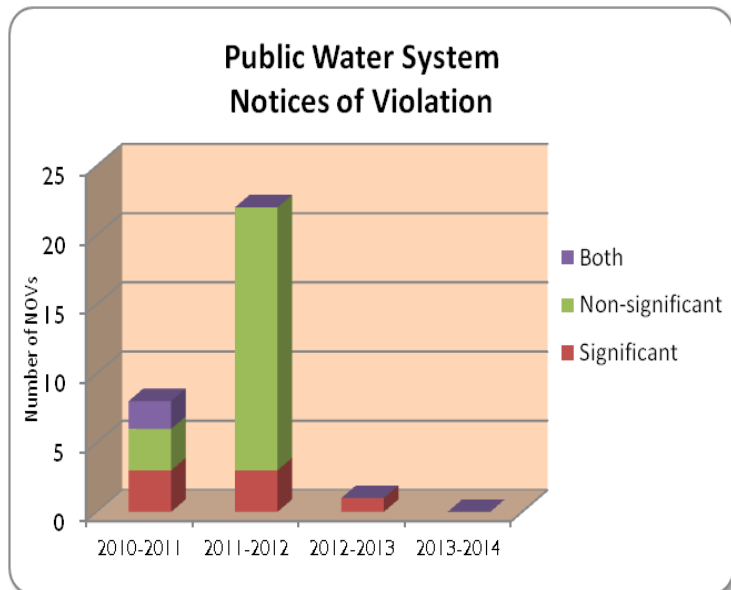


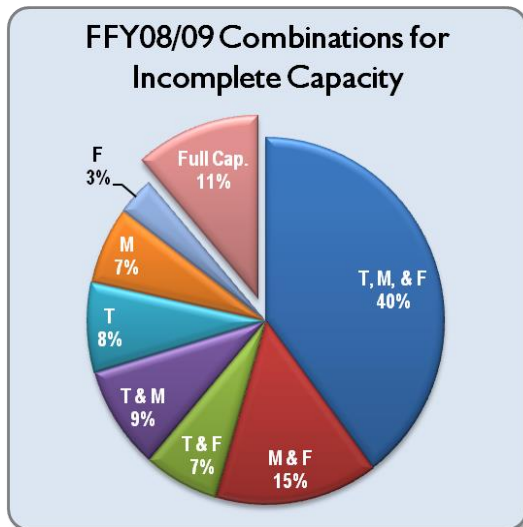
## Program Accomplishments

Since its inception, the Capacity Development Program has proven successful in its mission to improve technical, managerial, and financial capabilities through the sanitary survey process and various methods of assistance (i.e. guidance documents, templates, operations spreadsheets, direct on-site assistance). In past years, sanitary surveys have resulted in the issuance of Notices of Violation (NOVs) due to lack of response to deficiencies; both significant and non-significant. NOVs that were not address by PWSs led to further enforcement action.

In 2011, DOW personnel began tracking the NOVs issued based on the sanitary survey evaluation; significant improvements in the tracking process were made the following year. The adjacent figures regarding these NOVs and enforcement actions illustrate the positive effects of the Capacity Development program, decreasing from a total of 22 NOVs related to sanitary survey noncompliance issued in SFY2012 to zero NOVs issued in SFY2014.

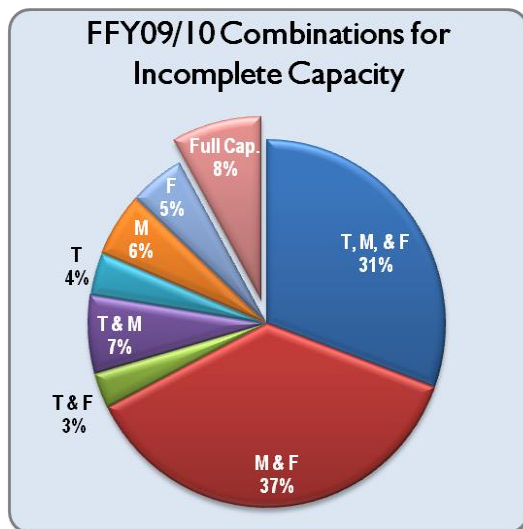
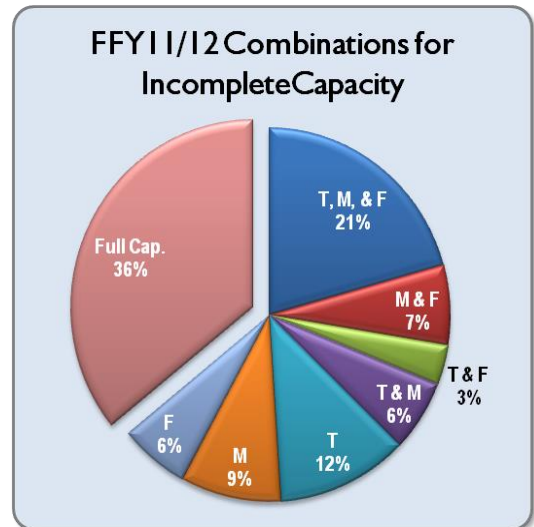
No enforcement actions have been required since SFY2011. This trend indicates a better understanding of the program requirements and of the Safe Drinking Water Act in general, as assistance has been provided to PWSs and PWS operators and managers have become better educated and more aware of current issues.





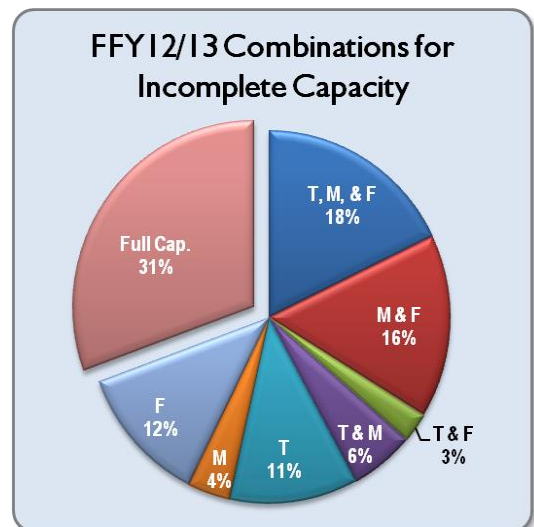
Another method of evaluating the effectiveness of the Capacity Development Program is by comparing the results of the initial, baseline survey results to subsequent surveys. This comparison is based on whether a system possesses or lacks one, two, or all three of the capacity parameters (technical, managerial, or financial) based on responses to the survey questions.

The first baseline surveys were completed in 2008/2009. Of the 88 systems surveyed that year, 11 percent were found to possess full capability to operate and manage their PWSs. Three years later the same systems again were similarly surveyed and 36 percent found to possess full capability to operate and manage their PWSs.



A second round of comparisons revealed similar results; 8 percent having full capacity in the initial surveys compared to 31 percent after three years. A third comparison round will be completed at the end of the current federal fiscal year.

Both of these comparisons reveal significant improvements in managerial and financial capacity;



primary concerns of the Capacity Development Program.

Improvements in PWS's technical, managerial, and financial capacity are attributed to several programs supported by the Drinking Water State Revolving Fund:

- ◆ Development of templates and guidance documents for Emergency Response Plans, Operation and Maintenance Manuals, water loss, cost of service, etc.
- ◆ Funding of a Technical Assistance program with Kentucky Rural Water Association program providing assistance with leak detection, water loss, rate studies, Emergency Response Plans, and Operation and Maintenance Manuals.
- ◆ Establishment and maintenance of an operator blog to help systems to remain current on upcoming events and technologies.
- ◆ Funding of a Capacity Development Assistance Program (CDAP) to provide limited financial assistance for small projects related to deficiencies cited in sanitary surveys.
- ◆ Direct technical, managerial, and financial assistance as needed or requested by the system to improve or maintain capacity.
- ◆ Operational assistance through the Area-Wide Optimization Program (AWOP).
- ◆ Funding assistance for failing or inadequate infrastructure through the DWSRF.
- ◆ Communication and education provided in cooperation with Area Development Districts, Kentucky Water and Wastewater Operator Association, Kentucky Rural Water Association, Kentucky Public Service Commission, KY-TN AWWA/WEA Water Professional's Conference, and the Association of State Drinking Water Administrators (ASDWA).

### *Barlow, Kentucky*

In 2011, the City of Barlow had problems. a water loss of between 25 and 30% was reported during their sanitary survey and they had a badly deteriorated clearwell with no redundancy. This situation presented technical, managerial, and financial difficulties for the city. The City needed to repair the clearwell to ensure proper operation and water quality, and their storage tank and water meters needed work to address water loss. These problems caused not only significant management difficulties, but also resulted in considerable lost revenue for the system.

Barlow began a program to replace water meters while applying for funding through the DWSRF to make major repairs. The 2011 DWSRF loan program funded a project to replace the old clearwell with a new dual system one which would allow them to perform maintenance without disrupting production. Additionally, the leaking and rusty storage tank was refurbished and repainted to meet regulatory standards.

These projects have successfully served to reduce managerial stress in how to operate the system and achieve compliance, as well as saving money. The most recent sanitary survey reported water loss of 24-28%. Barlow is not yet where they want to be, but progress is being made; thanks to financial assistance from the DWSRF.

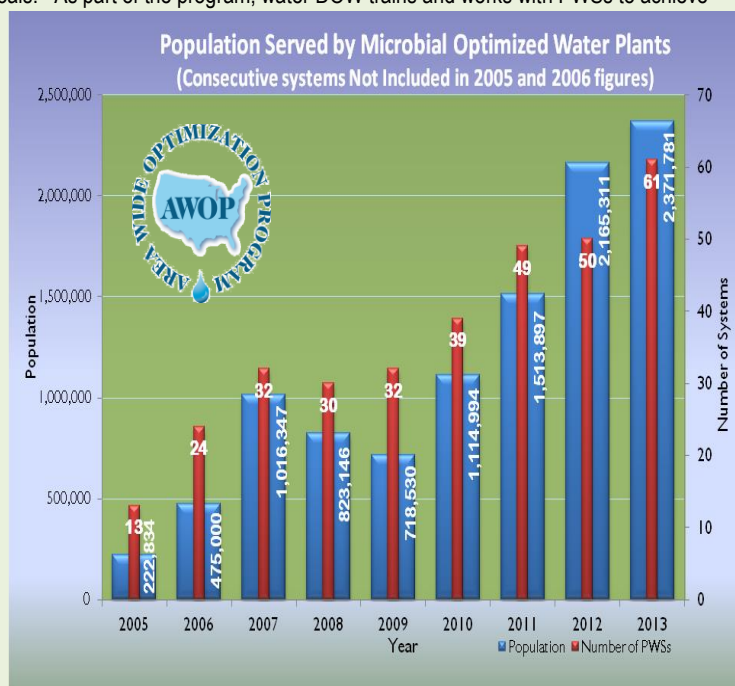


## Area-Wide Optimization Program (AWOP)

AWOP is a voluntary program designed by the USEPA as a mechanism to enhance the public health protection aspects of drinking water. In the AWOP program, public water systems work to optimize performance and operations of their water treatment facilities. Facilities take a proactive approach to compliance by adopting water treatment performance goals more stringent than state and federal regulations, and work to achieve those goals. As part of the program, water DOW trains and works with PWSs to achieve treatment goals.

As of 2013, there were 134 public surface water treatment plants in Kentucky. Of those, 61 facilities met their AWOP goals. Fifteen of the participating facilities serve populations under 10,000 people. Kentucky has been involved in the Area-Wide Optimization Program since 1999 and has successfully integrated the original AWOP turbidity concepts, goals and tools into other aspects of the drinking water program, essentially creating a new "mindset" towards drinking water quality and the challenges it presents.

In an effort to encourage systems to meet these high standards, an awards program was instituted in 2008 which has proven to have a considerable positive impact on compliance.



## Leak Detection and Water Loss



Water loss is currently one of the most serious issues facing public water systems. Infrastructure is aging, and as it does, leaks begin to occur. This results in increased operating, personnel, and repair costs. Based on information from the 2011 Drinking Water Infrastructure Needs Survey Assessment, out of the total \$4194.7 Million worth of needs reported for Kentucky, \$3,066.7 Million were related to transmission and distribution. This represents nearly 75 percent of the drinking water infrastructure needs in the state.

Kentucky's Capacity Development Program sought ways to assist public water systems in improving their water loss situation. Over a two year period, Kentucky dedicated a portion of the DWSRF set-aside funds for direct assistance to these systems.

In 2011, the City of Williamsburg reported a water loss of over 40%. After receiving funds for leak detection, they reported a water loss of 27% in 2014. This reduction saved the city approximately \$300,000 per year in production costs. Likewise, the City of Adairville reduced their water loss from 20% in 2010 to 10% in 2013; with an estimated cost savings of over \$9,000 per year.

| Monthly Water Loss Report                                      |       |
|--|-------|
| Water Company: Williamsburg Water Plant                        |       |
| For the Month of:  | Year: |
| March  | 2014  |
| Water Produced this month: 44,807,000 gallons                  |       |
| Water Purchased this month: 21,800,000 gallons                 |       |
| A. Total Water Produced and Purchased = 66,607,000 gallons     |       |
| B. Total Sold = 43,600,000 gallons                             |       |
| C. Difference (Produced/Purchased) - Sold = 23,007,000 gallons |       |
| D. % Difference = 34.54%                                       |       |
| E. Gallons of Water Accounted For:                             |       |
| Breaks (discussed) 420,000 gallons                             |       |
| Illegal Connections 2,000 gallons                              |       |
| Storage Tank Overflows 2,000 gallons                           |       |
| Other Losses 1,000 gallons                                     |       |
| Total Water Losses 425,000 gallons                             |       |
| F. Total Gallons Accounted For = 43,175,000 gallons            |       |
| G. % Loss = 5.22%  |       |
| H. Gallons / Day Loss = 711,000 gallons/day                    |       |
| I. Gallons / Minute Loss = 491 gallons/min                     |       |

## Challenges

Maintaining the technical, managerial, and financial viability of a drinking water system is not without its challenges:

- ◆ Revenues are decreasing as customers learn conservation techniques and more use is made of water-saving devices in homes and businesses. Many small systems have experienced a loss of revenue due to businesses leaving the area.
- ◆ Drinking water needs are competing for funds and consideration alongside other priorities, particularly within municipalities (i.e. roads, wastewater, and parks).
- ◆ Public water systems are often affected by the local and regional political climate.
- ◆ Federal and state regulations may cause additional stress on a system.
- ◆ Water systems are often understaffed particularly in the area of adequately licensed personnel.



- ◆ Water source control (new sources of contamination) and water loss within the distribution system (aging infrastructure) can be time consuming and costly problems.

The Capacity Development Program, in conjunction with its partners and stakeholders, strives to identify ways of helping systems to address these issues through innovative and improved methods of operation and management.

## Looking to the Future

As originally designed, the Capacity Development Program is focused on providing assistance to the small systems throughout the state. Over seventy percent of the public water systems in the state serve less than 10,000 people; over forty percent serve less than 3,300. To provide direct assistance to the nearly 300 small systems across the state is a daunting task any time, but particularly in times when budgets are tight and staff is reduced. Capacity Development personnel continue to work on guidance documents and templates for system use to improve performance, achieve compliance, and increase technical, managerial, and financial capacity.

A second focus for the future is to revisit the Capacity Development Strategy. This reevaluation will consider ways to improve communications, streamline the sanitary survey process, reduce staff administrative time, better identify inadequately performing systems, and provide incentives for outstanding performance. By reducing time spent on the sanitary survey process, personnel will be able to devote more time to assistance for small systems.

## Accessing the Report

This 2014 Report to the Governor is a requirement of the SDWA and is made available to the public.

- ◆ On-line at  
<http://water.ky.gov/DrinkingWater/Pages/CapDev.aspx>
- ◆ Press release at time of completion
- ◆ Available at all Division of Water offices (Frankfort and Regional Offices).

